THE

NAUTICAL MAGAZINE

AND

Naval Chronicle.

NOVEMBER, 1862.

Report on the Deep Sea Soundings to the Westward of Ireland,—*made in H.M.S. "Porcupine," in June, July, and August*, 1862.

Belfast, September 30th, 1862.

Sir,—The Atlantic Submarine Telegraph Company having requested the Lords Commissioners of the Admiralty to have some deep soundings taken off the western coast of Ireland, principally to ascertain whether the apparent sudden dip in the soundings from 550 to 1,750 fathoms, found by Commander Dayman in the year 1857, in the parallel of 52° 15′ N., extends further North or South, and to endeavour to seek out a more gradual slope into the bed of the ocean, their lordships were pleased to direct that the *Porcupine*, then fitting at Devonport for the survey of the North Sea, should be despatched on this service.

The *Porcupine* is a paddle steamer of 130 horse power and 380 tons. She was manned by a crew of forty-nine officers and men, and was fitted with a donkey engine for heaving in the line; also with five light iron reels, three large for the deep sea line, and two small for cod line, capable of holding 2,000 fathoms of line each. From these reels the line was run off when sounding, and reeled on them by hand, as it was hove in by the donkey engine. The *Porcupine* was also supplied at Devonport with 10,000 fathoms of the ordinary deep sea line and 13,000 fathoms of cod line, made expressly for deep sea sounding, with an ample supply of sinkers and weights, and the Bulldog and other apparatus for bringing up the bottom; Johnson's

and Hearder's pressure gauges to show the depth were also supplied, as well as metallic and ordinary deep sea thermometers to test the temperature. At Galway a further supply of 10,000 fathoms of Messrs. Newall's cod line was received on board, besides 11,500 fathoms of a smaller and less expensive line. The weight per 1,000 fathoms, with the breaking strain of these sounding lines, was as follows:—

Lines.	Fathoms.	Weight.	Breaking Strain
		lbs.	Cwt. lbs.
Ordinary deep sea	1000	230	6 63
Newall's cod.....	1000	56	3 14
Laid twine	1000	17½	0 100?
Marline.....	1000	29	0 100?
Mackerel.....	1000	26	0 100?

The lines were marked in the usual way, viz., blue at 50 fathoms, white at 100 fathoms, and red at 1,000 fathoms.

The soundings were always taken from the bow of the vessel. With the main and mizen sheets out we had no difficulty in keeping her head to wind; and an occasional easy turn ahead sufficed to keep her bow directly over the descending lead.

The principle of using a small line and heavy weight for obtaining the depth was that adopted. I believe it to be the only means at present known for obtaining the true depth.

When using a heavy line, such as the ordinary deep sea line, the difference of interval after the weight strikes the bottom is not sufficiently marked to enable one to say confidently when it is down, particularly should there be any sea, and none of the instruments we were supplied with, whether of a rotatory character, like Walker's, or those depending on compression, as Johnson's and Hearder's pressure guages, give any results that can be at all relied on.

The cod line supplied by Messrs. Newall, of Gateshead, is an admirable line for this purpose. The weight was sometimes brought up by it from great depths. On one occasion it raised a 64 lb. weight from a depth of 1750 fathoms; but as the whole quantity out is frequently sacrificed at each sounding, the expence becomes a serious consideration when the soundings are required near each other; and I found the lighter and much less expensive lines answer equally well in smooth water, where the depth of water alone was required.

The strongest line we had for bringing up a specimen of the bottom, with the instruments for testing the temperature and pressure, was the ordinary deep sea line. If, as it sometimes happens, the weight does not detach itself, this line would prove unequal to the strain, and at some sudden heave of the sea would break away, losing all our instruments.

The simplicity, cheapness, and certainty of action of the cup lead,

of from 56 lbs. to 75 lbs. weight, renders it an invaluable instrument in depths under a thousand fathoms, bringing up a good wine glass ful of the bottom at each cast. It may be used either with the cod or ordinary deep sea line. In greater depths when a specimen of the bottom was required, we used the Bulldog machine.

To save time, the two operations of determining the depth by a small line, and sending down the instruments for scientific purposes, were carried out together, an officer being stationed at each line to time the marks in their passage over the gunwale. A deep sounding, when the instruments were to be recovered, would occupy from two to four hours.

Having made these preliminary observations, I may now proceed with the progress of the voyage.

Having swung ship for compass deviation, I sailed from Plymouth Sound on the 22nd of June, and on the 24th commenced our examinations, in pursuance of your orders, at the 100 fathoms line on the 51st parallel of latitude. The deep water valley crossed by Commander Dayman ninety miles west of Valentia, was found to extend to this parallel, as we had 1,180 fathoms in its deepest part and 375 fathoms on the bank outside it. From the depth of 1000 fathoms in this depression, the Bulldog machine brought up a bivalve shell embedded in the soft clay.

On crossing the bank to the westward, we passed from a depth of 710 fathoms to 1,550 fathoms in a distance of seven miles. Although this increase of depth seems so great, if the incline is gradual, of which we have no evidence to the contrary, it amonnts to but 12 feet of dip in 100 feet horizontal, or about 1 in 8.

To the westward of this we dropped our lead on the position of a reported vigia (the Brazil Rock) and obtained 2,350 fathoms, and here the deep sea line being unequal to the strain broke, taking with it all our instruments attached.

With reference to this and other vigias in this part of the ocean, I may observe that we frequently passed balks of timber, covered with barnacles and sea weed, having somewhat the appearance of a rock awash.

Carrying out the system of sounding laid down for me in your orders in the parallel of 51° 35′, we passed from 1,440 to 930 fathoms in a distance of 2·7 miles, or a little under 19 feet of dip to 100 feet horizontal, and this is the steepest incline we have met with.

The unsettled weather we experienced frequently interrupted our work, and on the 8th of July, having expended our coals, I ran into Galway to replenish, and obtain a fresh rate for our chronometers.

We were detained here by continual gales until the 21st, when the weather moderating we again sailed, carrying out a line of soundings with us; but had scarcely arrived on our ground, when the weather became more severe than ever, and on the morning of the 24th, while lying to in a heavy gale, we had the misfortune to twist our rudder-head off. This compelled us to return to Galway for repairs, and in

the absence of the proper means for effecting them, we were delayed there until the 6th of August. During this time and indeed throughout the whole of our cruize, the weather was very unsettled, occasioning a great loss of time.

On the 8th of August we were enabled to sail from Cashell Bay, where, on leaving Galway, I had gone for shelter. Carrying out a line of soundings on the parallel of Slyne Head, at the distance of one hundred and twenty miles to the westward of it, we crossed the tail of a bank of 82 fathoms, coarse gravel. This being entirely new, I have named it the Porcupine Bank. It will be of use to vessels bound to Galway from the westward as a means of ascertaining their position by the lead. The bottom both to the northward and southward is deeper, being composed of fine dark sand, while the bank is composed of gravel and coarse sand.

August 10th, in lat. 53° 30′, long. 15°, found the current from a boat moored to the bottom S.E. ½ S. 0·5 knot, which agrees with that shown by our reckoning for the last two days. Numerous pipe fish, some with ova attached, were swimming on the surface; some of these were preserved.

Aug. 11th.—Our soundings this day taught us that in the parallel of 54° 10′, the Irish Bank does not extend so far to the westward, and that Rockal is probably a separate bank.

Aug. 12th.—Weather again unsettled, with a heavy sea. Having determined the N.W. limit of the Irish Bank, bore away towards the tail of the Rockal Bank, sounding at intervals in from 1,500 to 1,200 fathoms, shoaling as we approached the Rockal Bank.

Aug. 14th.—At noon observed Rockal with several fishing vessels near it. There being too much sea to do anything in the vicinity of the rocks, hove to for the night.

Aug, 15th.—Got observations for latitude and longitude; found the current setting with flood tide N.b.E. 0·8 knot. The weather having become fine with only a moderate swell, sent a boat with a party to land on the rock; but the sea broke so heavily round it that the officer in command thought it would be imprudent for them to do so. One of the party, Mr. Johns, the boatswain, succeeded in getting a footing, but not at the part where the summit is accessible.

The fishery is in the vicinity of the rock; but this very remarkable peak of a submarine mountain standing as it does in solitary grandeur above the ocean surface, is not unworthy of some attention in this report.

Rockal is in lat. 57° 35′ 53″ N. by meridian altitude of sun; long. 13° 42′ 21″ W., mean of a.m. and p.m. sights, four chronometers, sea horizon. The rock has an elevation of 70 feet above the sea, is about 250 feet in circumference at its base, and is composed of a coarse granite.*

The summit of the rock, sharp pointed and whitened by birds, can

* Specimens have been sent to various museums in Ireland.

only be gained from its N.E. side, and landing is at all times difficult, for it is steep on all sides. On the N.E. side, however, is a small detached rock, called Haslewood Rock, uncovered at half tide, with 30 fathoms of water between it and Rockal, from which it bears N.E.b.N. a cable and a half distant.

Helen Reef, bearing S. 79° E. two miles from Rockal, has about 6 feet water over it at low water. It is so called from a vessel of that name that was wrecked on it, and is very dangerous. The situation of it is generally shown by its breakers, but towards high water and in very fine weather, it only breaks at long intervals. From being small and steep to, there is then nothing to indicate the approach to it. To avoid it keep Rockal clear of a W.b.N. bearing. There is a safe passage between it and the rock.

The lowest estimate that was formed of the range of the tide, (judging from the appearance of the rock,) was 6 feet; but this seems large for a tide wave in mid ocean. Purdy's *Atlantic Memoir* presumes to discredit the existence of any danger near Rockal, but is mistaken.

From Rockal we steered for the Irish coast, when nearly midway between it and the Irish Bank, we obtained one sounding of 1,660 fathoms, and found the current here from a boat moored to the bottom S.E.b.E. ½ E., one knot.

From the edge of the Irish Bank I carried a line of soundings into Enis Head, and then proceeded to Valentia for coals. On receiving which, having carried out my instructions and effected the object of our cruize, I returned to Cork for further orders, getting a few soundings by the way.

In the course of our operations we found the donkey steam engine and the light iron reels for running the line off very serviceable, indeed indispensably necessary to our success. The Bulldog machine fully answered the purpose of bringing up a large quantity of the bottom, but we could not always get the weight to detach. On one occasion, too much line having been paid out, the bight got between the jaws of the nipper and prevented its closing; this lost us our specimen, but it affords another illustration of the line going straight down on the weight, and the consequent absence of any under current.

In carrying out this service I received every assistance from the officers on board, who all united their best endeavours to bring our cruize to a successful termination.

With reference to the principal object of our inquiry, that of finding a more gradual slope into the bed of the ocean, I consider that our soundings, shown in the accompanying chart, clearly prove that the general dip of the bank presents no difficulty whatever to laying a cable either from Valentia or Loop Head, or any other part of the West coast of Ireland between Bantry and Blacksod Bays, that may offer facilities for securely landing and working it.

Much pains were taken by sounding at short intervals to discover if anything like a precipice existed. Our steepest incline shows a

difference of level of 3,060 feet in 2·7 miles, or about 19 feet in 100 feet.* On the parallel of 51° 20′ we have a dip of 7,680 feet in a distance of fourteen miles. The intermediate soundings give no evidence of a precipice; but a mountain of this height on the land would present an imposing appearance, with perhaps some steep escarpments.

On the adjacent coast of Ireland we have precipices of 2,000 feet in height within half a mile of the shore. However these may have been caused, whether by the coutinued action of the Atlantic waves at their base, or by the erosive power of glacial or atmospheric agencies operating on their slopes, it is certain that the submarine mountains are uot exposed to this action, or to any denuding process whatever. But it is more probable that any inequalities in them arising from original formation have been filled up by the gentle depositions of the soft clay that we found everywhere covering their slopes.

On examining the soundings the slope will be found to vary from 6 to 19 feet dip in 100 feet horizontal, a dip that cannot possibly strain or injure the cable. The knowledge of this fact will, I trust, remove one of the supposed difficulties in the way of laying it, and help to forward the successful realization of this great national undertaking.

I am. &c.,

R. HOSKYN, *Master and Surveyor.*

Rear-Admiral Washington, F.R.S., &c.,
Hydrographer.

Abstract of the Experiments made with the Pressure Gauges and Deep Sea Thermometers from the Sounding Log.

June 25th.—In 1,000 fathoms water.

Board of Trade min. ther., No. 49, registered 44°.

Johnson's metallic ther., No. 8 37°.

Johnson's pressure gauge, did not act, the stopper had not moved.

Hearder's pressure gauge, all the mercury ran out of the legs into the tube, probably from its having capsized on the bottom.

June 27th.—In 2,350 fathoms.

Board of Trade min. ther., lost by line carried away.

Johnson's metallic ther., lost by line carrying away.

July 22nd.—In 200 fathoms.

Johnson's pressure gauge, did not act.

Board of Trade min. ther., registered 54°.

* Those depths to which we have added an asterisk (*) indicate, with others on the bank inside of them, the places where this gradual slope of the bank is found; the incline being about one half of that of the usual shingle beach.—ED.

Johnson's metallic ther., No. 9, 49°.
Board of Trade min. ther., 50·5°.
Johnson's metallic ther., No. 9, 48·5°.

August 10*th*.—In 540 fathoms.
Hearder's pressure gauge, the mercury was all disjointed, some in outer tube, no result.
In 820 fathoms.
Hearder's pressure gauge, lost by line parting.
In 1,500 fathoms.
Board of Trade ther., No. 18, registered 59°.
In 1,550 fathoms.
Johnson's metallic ther., No. 9, 31°.

August 11*th*.—In 1,540 fathoms.
Hearder's pressure gauge, No. 2, on coming up the short leg registered 750 fathoms; the long leg was full; in a few minutes after coming up the short leg fell to 1,000 fathoms.

August 12*th*.—In 690 fathoms.
Hearder's pressure gauge, No. 2, on coming up the short leg registered 1,200 fathoms; the long leg was full: shortly afterwards the short leg registered 1,425 fathoms.

August 16*th*.—In 1,660 fathoms.
Board of Trade ther., No. 18, 51°.

August 29*th*.—In 400 fathoms.
Johnson's pressure gauges, Nos. 1 and 2, did not act.
Repeated the experiment,—they did not act.
Hearder's pressure gauge, short leg registered 950 fathoms, long leg, 300 fathoms.

Every injunction of the inventors for using these instruments was strictly complied with by Mr. Davis, who took great pains to secure their efficient working.

Johnson's metallic thermometer appears to give good results.

I think the reading of the Board of Trade thermometer is sometimes vitiated by the index not retaining its position.

Johnson's pressure guage never seemed to be in the slightest degree affected by pressure. Is it not possible that the water may pass freely round the cork without moving it? If the plug is forced into the tube with thn finger, instead of compressing the water passes it.

Hearder's pressure gauge is of no practical use in its present form. The liability to fall on its side on the bottom, will always interfere with its results.

R. Hoskyn.

In all cases in the following soundings the bottom was found and the depth fairly measured,—but where the line parted in coming up, the sounding being lost the character of the bottom could not be ascertained.

Date.	Latitude.	Longitude.	Depth.	Nature of Soundings.
	° ′	° ′	Fathoms	
June 25	50 44·5	11 36·5	900	Drab coloured sandy mud.
,,	50 55	11 52	980	Stiff sandy clay.
,,	50 56	12 6	1000	Stiff sandy clay.
,,	50 57	12 20	1080	Sandy clay.
,,	50 58	12 40	1120	Line broke from strain, 1,050 fms.
,,	50 59	13 0	1180	Sandy clay.
,,	51 0	13 22	1175	Sandy clay.
26	50 59	13 30	930	Sandy clay.
,,	51 3	14 46	510	No indication.
,,	51 4	15 6	710	Sp. sand.
,,	51 4	15 19	1550*	Line parted—no bottom found.
27	50 56	15 21	1900	Line parted at 1,000 fathoms.
,,	51 9	15 59	2350	On site of Brazil Rock—a good up & down soundg.—lost at 2,250 f.
,,	51 19	15 32	2050	Line parted at 1,900 fathoms.
,,	51 19	15 15	1750	Good up & d. sndg.—lost at 1000 f.
28	51 25	15 15	1550*	No indication.
,,	51 35	15 19	1440*	Clay.
July 2	51 52	15 22	1200*	Line parted at 1,000 fathoms.
,,	51 51	15 21	1250	Line parted at 1,150 fathoms.
,,	51 50·5	15 31	1450	Sandy clay—ending unsatisfactory.
3	51 57·5	15 17	1250*	Parted at 1,000 fathoms.
,,	52 8	15 30	1240*	Sandy clay.
6	52 21	15 31	1570*	Sandy clay.
,,	52 18	15 15	710	Sandy clay.
,,	52 19	15 2·5	570	Sand.
23	52 58	15 8	1050	Line parted.
,,	52 58	15 20	1470*	Sandy clay.
Aug. 10	53 22·5	14 45	820	Line parted at 700 fathoms.
,,	53 22	15 0	1500*	Sandy clay.
,,	53 40	15 4	1550	Sandy clay and stones embedded. Greenstone & basalt ang. ¼ in. sq.
,,	53 40	14 47	1300	
11	53 39	14 46	1220*	Line got into nippers.
,,	53 53·5	14 14	900	Muddy sand—parted at 800 fms.
,,	53 59	14 25	1540	Sandy clay & stones—lost at 1400 f.
,,	54 0·5	13 58	1120	Sdy cly. Bank recedes E. Rockal is probably on a separate bank.
12	54 8	13 25	1350*	Sandy clay.
,,	54 6	12 50	690	Sandy clay.
,,	54 16	13 6	1580	No specimen, line parted.
,,	54 39	13 44	1500	Line parted at 1,400 fathoms.
13	55 14	14 42	1300	Line parted at 1,280 fathoms.
,,	55 33	14 40	1220	Line parted at 1,050 fathoms.
,,	55 53	14 38	800	Sandy clay.
16	55 31	12 11	1660	Mud.
17	54 20	12 44	840	No specimen.
,,	54 20	12 23	1380	Drab coloured sandy mud.
,,	54 20	12 7	980	Sandy clay.
28	52 40	15 38	1750	Sandy clay.
,,	52 45	15 15	1120	Sand and shells.

The foregoing report sets at rest the imagined difficulty of the precipitous character of the approaches from the sea bed to the western coast of Ireland; Mr. Hoskyn having found several depths (to which we have affixed an asterisk in his tabulated statement) where the slope has been found by him in some as little as one in six,—that of an ordinary shingle beach. A few more soundings would have been acceptable to the southward, but sufficient are obtained on a direct line to show that a cable may be laid there so as to gain the deep bed of the Atlantic by an easy descent. This would be better shown on a large scale, but we have sketched out this section on our chart as conveying an idea of the slope in that latitude, and probably sufficient data will be found in the report for others hereafter. The whole operations of the voyage are highly creditable to Mr. Hoskyn, and his report as far as it goes quite satisfactory in regard to a line for a cable.—Ed.

Journal of Captain Cracroft, C.B., of H.M.S. "Niger."—*New Zealand.*

(Continued from p. 519.)

The following morning early, I paid the camp a visit with the Governor. The troops had been under arms since 2h. a.m., but every thing was quiet, and his Excellency returned on board apparently satisfied that no attempt would now be made by the natives to disturb the peace of the colony. We were getting under way afterwards, to return to New Plymouth, when two guns in quick succession were fired from the camp. This startled us not a little, but I interpreted it as a signal for assistance, although utterly at a loss to conjecture the cause.

Hoisted the boats out immediately, and landed with the small arm company and marines, a twelve pounder howitzer, and rocket tube, and joined the force under Colonel Gold, which with this reinforcement mustered upward of 440 men, viz., 350 of the 65th regiment, 18 royal artillery and sappers, and 72 naval brigade, besides a strong boat guard.

We now ascertained the cause of alarm. It appears that during the night the Maories had thrown up a pah or stockade on the road to New Plymouth, within two miles of the camp, and threatened to stop all the supplies; three provision carts escorted by mounted volunteers having only got past with some difficulty, and showing a bold front. As this sort of thing could not be permitted, the die was now cast, and the following letter was sent to the natives by the Governor, through the native agent, Mr. Parris.

"To the Chief who obstructs the Queen's road.

"You have presumed to block up the Queen's road, to build on the Queen's land, and to stop the free passage of persons coming and going.